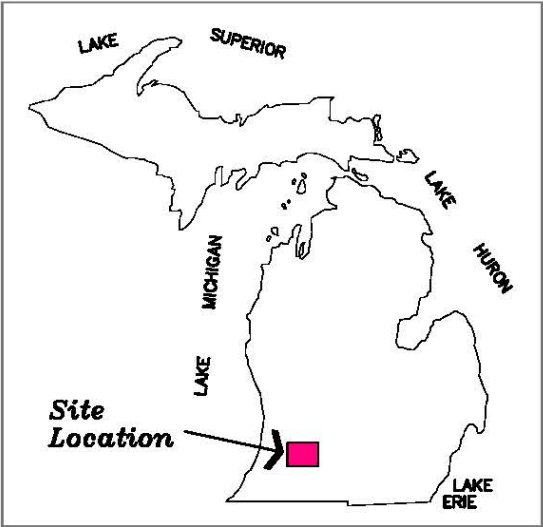


EQM CONTACT
Environmental Quality Management
18000 Carillon Boulevard
Cincinnati, OH 45240
(513)-265-8875
Mr. Eric Bowman

CONSULTANT CONTACT
KIESER & ASSOCIATES, LLC
536 E. Mich. Ave, Ste 300
Kalamazoo, MI 49007
(269) 344-7117
Mr. Brian Boyer, P.E.



KALAMAZOO COUNTY, MICHIGAN



PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087
PORTAGE CREEK - SITE SA-1C



SITE LOCATION MAP

INDEX OF DRAWING SHEETS	
1	Cover Sheet
2	Site SA-1C Vegetation Plan
3	Detail Drawings
4-6	Specifications

CITY OF KALAMAZOO
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>
T2s R11w, SE 1/4 of Section 22
in Kalamazoo County, Michigan.



Know what's below.
Call before you dig.
1-800-482-7171

NOTES:
ALL EXISTING UTILITY LOCATIONS DEPICTED ON THESE PLANS ARE APPROXIMATE; BASED ON AVAILABLE INFORMATION AND FIELD OBSERVATIONS BY OTHERS. AS A RESULT, UTILITY LOCATIONS SHOWN ARE NOT EXACT. DO NOT ASSUME THESE ARE THE ONLY UTILITIES PRESENT.

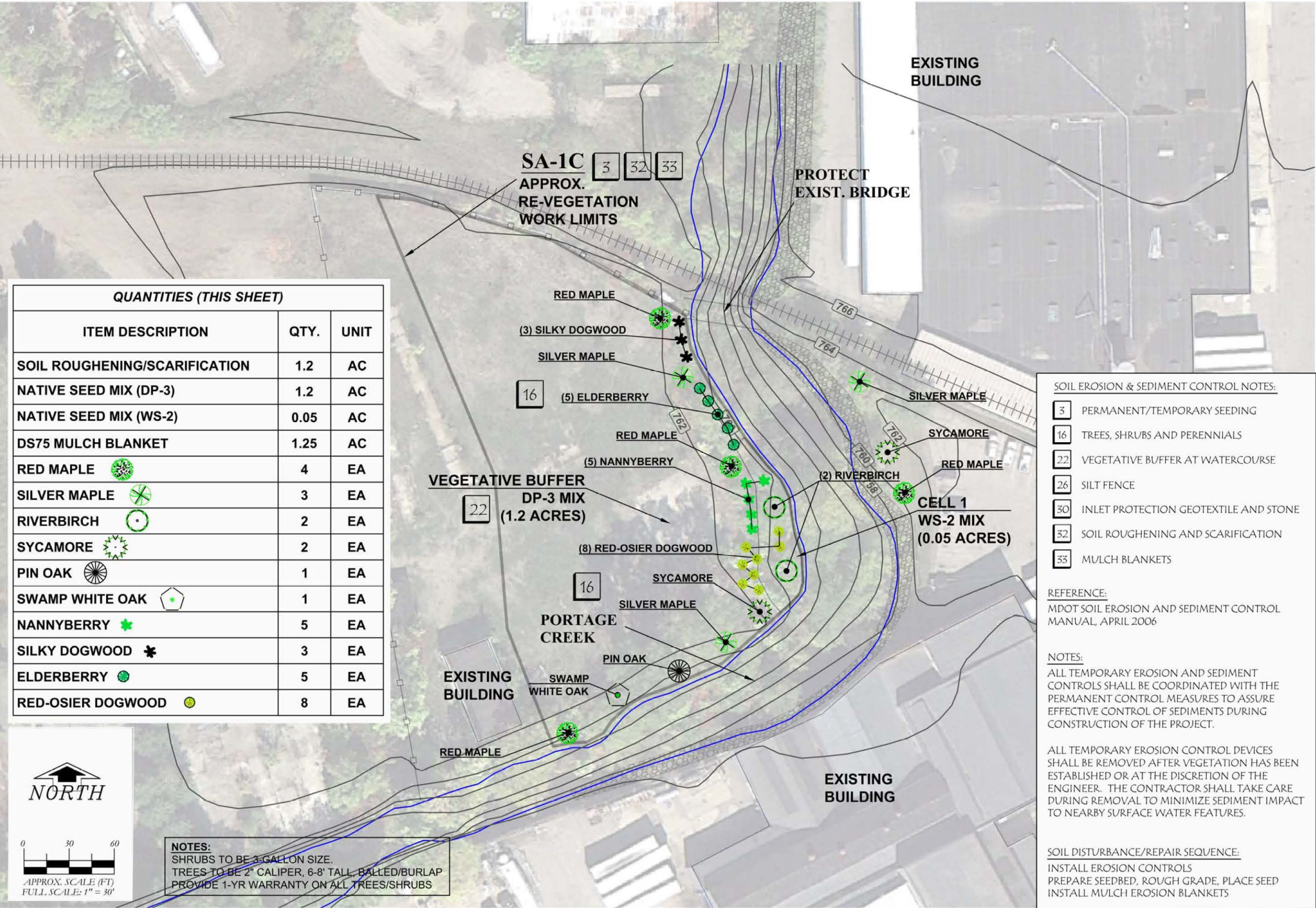
NOTE TO CONTRACTOR:
3 FULL WORKING DAYS BEFORE YOU DIG, CALL "MISS DIG".

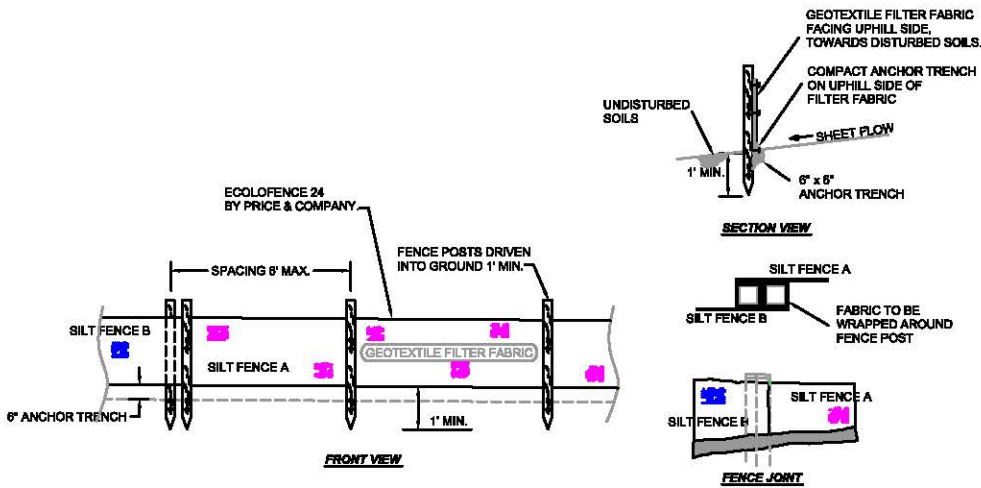
EROSION CONTROLS

1. ALL CONSTRUCTION SHALL COMPLY WITH THE SOIL EROSION AND SEDIMENTATION CONTROL ACT (P.A. 347 OF 1972, AS AMENDED).
2. ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4. CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5. ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6. CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
7. SUPPLEMENTAL SOIL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO ENSURE

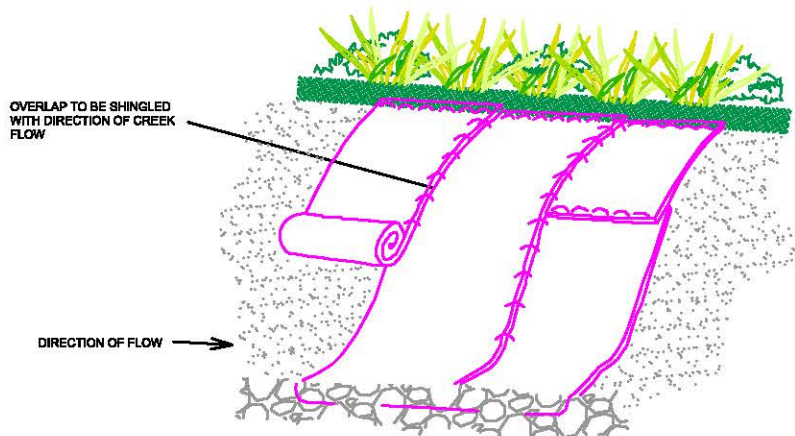
GENERAL NOTES:

1. The Contractor is responsible for contacting MISS DIG (1-800-482-7171) at least 3 working days before construction begins. The Contractor shall provide the MISS DIG ticket number upon request. Any utility conflicts must be presented to the Engineer in writing prior to commencement of work.
2. With EPA oversight, Contractor is not required to obtain permits for re-vegetation work.
3. The Contractor is responsible for knowing and following all appropriate safety standards which are required by the Michigan Occupational Safety and Health Act.
4. Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5. Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
6. Contractor shall keep disturbance of all areas of construction to a minimum.
7. Locations and elevations of existing utilities are not exact. Contact Miss Dig at 1-800-482-7171, prior to beginning construction.
8. Existing utilities destroyed or disturbed by the Contractor's operations shall be repaired at the Contractor's expense.
9. Hand dig in all areas of existing utilities.
10. The contractor shall be required to prevent movement of soil off site. Additional silt fencing may be required beyond that already on-site. Any additional silt fencing shall be incidental to work.
11. All work shall be checked for accuracy to the plans by the Contractor prior to installation.



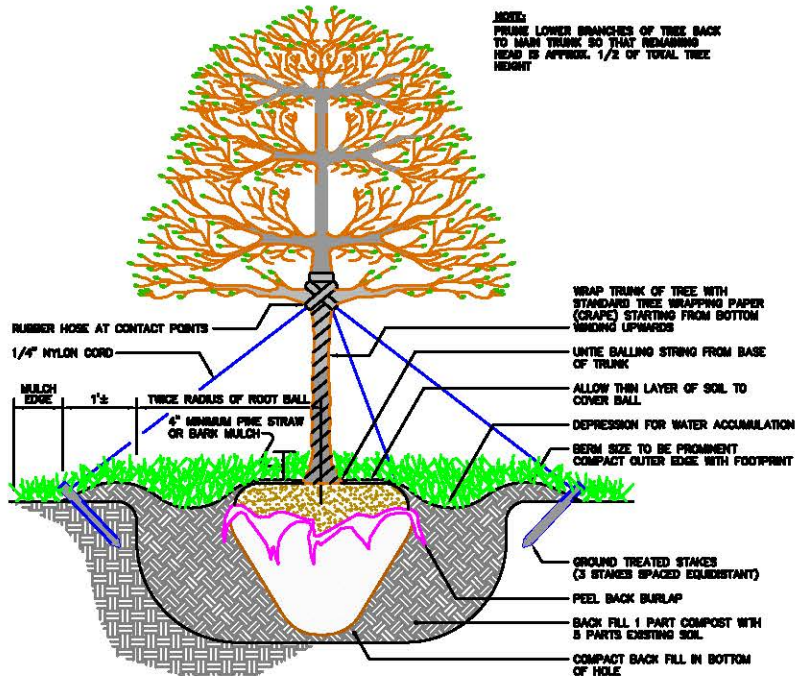


1 SOIL EROSION CONTROL
GEOTEXTILE SILT FENCE
NO SCALE

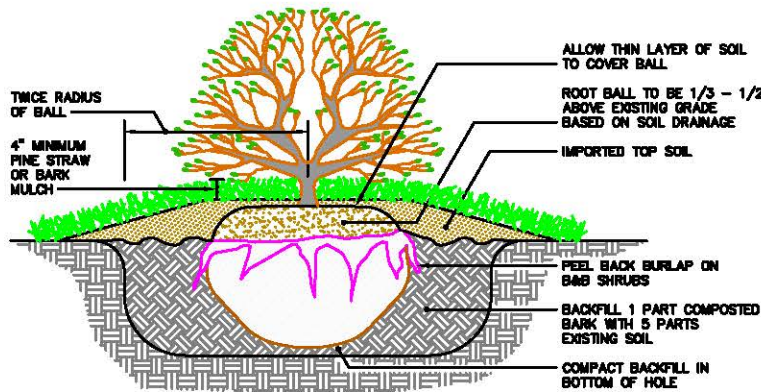


2 EROSION CONTROL BLANKET DETAIL
NO SCALE

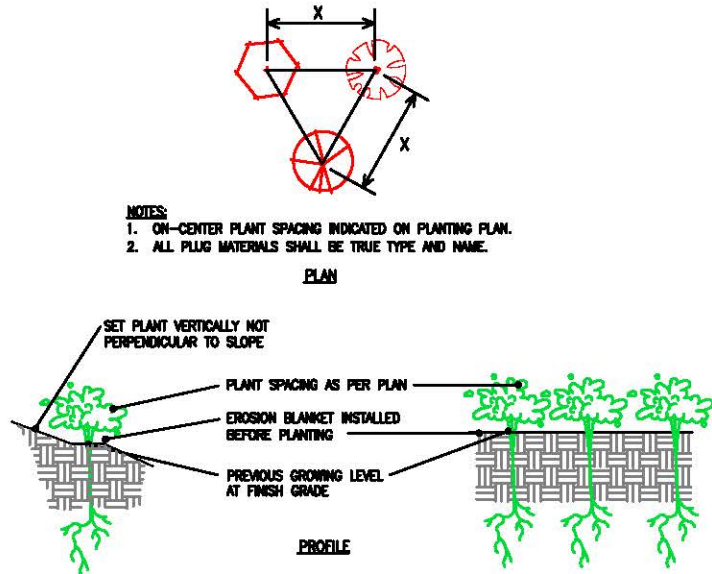
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF SEED.
 2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
 3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
 4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
 5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
 6. BLANKETS SHALL BE PINNED IN ROWS NOT MORE THAN 2 FT O.C. WITH A MAXIMUM OF 20" BETWEEN PINS, 3.5 PINS PER SQ. YD.
 7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



3 STAKING AND PLANTING
TREE DETAIL
NO SCALE



4 SHRUB DETAIL
CONTAINER AND B&B
NO SCALE



5 PLANTING
GROUND COVER - NO SCALE

SA-1C VEGETATION

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Preparation of grades to receive seeding and vegetation.
- B. Seeding.
- C. Seed protection on slopes.
- D. Planting special seed mixes.
 - 1. **DP-3** (Short Stature Prairie Seed Mix)
 - 2. **WS-2** (Riparian Mix)
- E. Maintenance and Warranty.

1.02 SUBMITTALS

- A. Documentation must include the following:
 - 1. Submit seed tags to Engineer prior to seeding.
 - 2. Submit copy of invoice to media amendment.

1.03 QUALITY ASSURANCE

- A. Grass seed shall meet the tolerance for germination and purity of the Official Seed Analyses of North America.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of testing, and location of packaging. Damaged packages are not acceptable.

1.05 EXISTING CONDITIONS

- A. Beginning work means acceptance of existing conditions.

PART 2. PRODUCTS

2.01 GROWING MEDIA

- A. Topsoil
 - 1. Existing topsoil shall be re-used.
 - 2. Import additional topsoil as needed to minimize weed seed viability.
- B. Water
 - 1. To be furnished by the Contractor. Portage Creek is an acceptable source.

2.02 SEED

- A. Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

2.03 SEED MIXTURE

- A. All special native seed mixes shall be purchased from the following supplier:

1) Heartland Restoration Services, Inc. **Contact:** Eric Ummel
14921 Hand Road
Fort Wayne, Indiana 46818
Ph: (260) 489-8511
Fx: (260) 489-8607
Email: mail@earthsourceinc.net

Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

2) Wildtype Native Plant Nursery **Contact:** Bill Schneider
900 N. Every Road
Mason, MI 48854
Ph: (517) 244-1140
Fax: (517) 244-1142
E-mail: wildtype@msu.edu

3) Hidden Savanna Nursery **Contact:** Chad Hughson
18 N Van Kal Street
Kalamazoo, MI 49009
Ph: (269)352-3876
Email: info@hiddensavanna.com

4) American Roots **Contact:** Trish Hacker-Henning
1958 Hidden Lake Trail
Ortonville, MI 48462
Ph: (248) 627-8525 or (248) 882-7768
Fax: (248) 627-3865
Email: americanrootsnat@aol.com

5) Sandhill Farm **Contact:** Cheryl Tolley
11250 10 Mile Road
Rockford, MI 49341-7954
Ph: (616) 691-8214
Fax: (616) 691-7872
Email: cherylt@iserv.net

6) Native Landscapes **Contact:** Randy Counterman
28092 M-40 Hwy.
Paw Paw, MI 49079
Phone: 269-929-3455
Email: randy.counterman@gmail.com

B. Special Native Seed Mixes

1) **Midwestern Short Stature Prairie Seed Mix (DP-3)**

Approximate mix weight 43 lb/acre with 74 native seeds/sq. ft.
44.4% Grasses/Sedges/Rushes; 44.1% Forbs; 11.4% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Bouteloua curtipendula	Side Oats Grama
Carex bicknellii	Bicknell's Sedge
Elymus virginicus	Virginia Wild Rye
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
<i>Forbs</i>	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Milkweed
Aster excooides	White Heath Aster
Coreopsis lanceolata	Sand Coreopsis
Coreopsis palmata	Prairie Coreopsis
Echinacea purpurea	Purple Coneflower
Gentiana andrewsii	Fringe-top Bottle Gentian
Helianthus occidentalis	Few-leaf Sunflower
Lespedeza capitata	Round-headed Bushclover
Liatris aspera	Rough Blazingstar
Liatris scariosa nieuwlandii	Savanna Blazingstar
Lupinus perennis	Wild Blue Lupine
Parthenium integrifolium	Wild Quinine
Penstemon digitalis	Foxglove Beard Tongue
Petalostemum purpureum	Purple Prairie Clover
Potentilla arguta	Tall Cinquefoil
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia hirta	Black-eyed Susan
Solidago nemoralis	Gray Goldenrod
Tradescantia ohiensis	Ohio Spiderwort
Verbena stricta	Hoary Vervain
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Avena sativa	Seed Oats

2) **Midwestern Riparian Seed Mix (WS-2)**

Approximate mix weight 73 lb/acre with 46 native seeds/sq. ft.
13.9% Grasses/Sedges/Rushes; 5.4% Forbs; 80.7% Temporary Cover Grasses

***SPECIAL NOTES:** Please incorporate *Carex stricta* and *Carex bebbii* into seed mix.
Substitute Giant St. John's Wort (*Hypericum ascron*) for Wingstem (*Verbesina alternifolia*).

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Carex frankii	Frank's Sedge
Carex muskingumensis	Palm Sedge
Carex normalis	Spreading Oval Sedge
Carex squarrosa	Squarrose Sedge
Carex vulpinoidea	Fox Sedge
Cinna arundinacea	Common Wood Reed
Elymus canadensis	Canada Wild Rye
Elymus riparius	Riverbank Wild Rye
Elymus virginicus	Virginia Wild Rye
Glyceria striata	Fowl Manna Grass
Leersia oryzoides	Rice Cut Grass
Panicum virgatum	Switch Grass
Scirpus atrovirens	Dark Green Bulrush
Scirpus pendulus	Drooping Bulrush
<i>Forbs</i>	
Aster novae-angliae	New England Aster
Bidens cernua	Nodding Bur Marigold
Eupatorium purpureum	Purple Joe Pyc Weed
Eupatorium rugosum	White Snakeroot
Heliopsis helianthoides	False Sunflower
Lysimachia ciliata	Fringed Loosestrife
Rudbeckia laciniata	Green-headed Coneflower
Rudbeckia triloba	Brown-eyed Susan
Silphium perfoliatum	Cup Plant
Verbesina alternifolia	Wingstem (substitute Giant St. John's Wort)
Vernonia gigantea	Tall Ironweed
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Agrostis alba	Redtop
Agrostis alba palustris	Creeping Bent Grass
Avena sativa	Seed Oats
Lolium multiflorum	Annual Rye Grass

- C. Weed seed content shall not exceed 0.25 percent for any variety of seed mixture.
- D. Seed shall be mixed by the dealer. Furnish dealer's guaranteed statement of composition, mixture and percentages of purity, and germination of each variety.

PART 3. EXECUTION

3.01 SEEDBED PREPARATION

- A. Within all disturbed Project Areas, the surface of the topsoil shall be rough graded and prepared for seeding by removing rocks and debris larger than 2-inch diameter. All windrows shall be eliminated. Hand raking shall be performed around all structures to form smooth transitions.

3.02 SEEDING & FERTILIZING

- A. Contractor shall broadcast seed all topsoiled restoration areas at the rates recommended by the seed supplier for each type of native seed mix specified.
- B. Seed shall be applied to all Repair Areas at the approximate rates shown below. The Contractor shall submit a certified list of the actual seed percentages used in the Repair Areas.

3.03 MULCHING & EROSION CONTROLS

- A. On the Project Areas receiving native seed mixes, the Contractor shall furnish and install mulch blankets at the locations and to the limits shown on the construction drawings. The mulch blanket shall be North American Green DS75 Straw Blankets. The Contractor shall install and anchor the mulch blankets with wood or metal stakes in accordance with the manufacturer's recommendations. Mechanical anchoring shall be performed in a manner that creates ridges perpendicular to flow of water. Where blankets are used in flow areas, the upstream end of each section shall be buried in a trench to a minimum depth of 6 inches. The Contractor shall water the mulch blanket areas at a rate of approximately 2,000 gallons per acre. Water may be obtained from the onsite creek.
- B. Shredded straw mulch shall be applied at a rate of 2 tons per acre on the adjacent disturbed general lawn areas and spoils fill areas. Shredded straw mulch shall only be applied when wind speeds are 5 mph or less, except if approved otherwise by the Owner. The shredded straw mulch shall be anchored with a sharp-edged "crimping tool". The crimping tool shall be capable of partially cutting, embedding and anchoring the straw so it will not be blown away. The entire surface of the mulched Project shall receive two passes of the crimping tool. The second pass shall be 90 degrees to the first, unless approved otherwise by the Owner.
- C. All soil erosion control products, including (but not limited to) silt fence, erosion control blankets, mulch netting, biostake anchoring pins, non-woven geotextile fabric, and coir logs shall be purchased from the following supplier:

Hanes Geo Components
425 36th Street SW
Wyoming, MI 49548
Ph: (616) 530-8230
Fx: (616) 530-2317

Contact: Mark Cavanaugh

- D. Minimum Erosion Control Products (as specified on the drawings).
 - 1. Straw Single Net Erosion Blankets (100% biodegradable).
 - 2. TerraTex HPG-44 Geotextile Fabric
 - 3. Ecolofence 24" Silt Fence

- E. Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.

- F. All temporary erosion control devices should be in place prior to the start of construction/excavation activities, to the extent possible. The Contractor shall remove all temporary erosion control devices once full vegetation has been established.

3.04 MAINTENANCE

- A. Maintenance responsibilities begin immediately upon completion of seeding and planting, and shall continue for a period of 1-year. All wind, water, fire, vandalism, or natural damage that occurs during this time frame shall be repaired by the Contractor within 5 days of being notified by EQM at no additional cost to the project. Repairs shall be completed in a manner that meets the requirements of these specifications.

3.05 GUARANTEE

- A. It is the responsibility of the Contractor to establish and maintain a dense growth of vegetation, for a period of 1-year. All trees and shrubs shall be provided with a minimum 1-year warranty. Institute measures to protect completed landscape areas. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense growth is established. The Contractor shall repair damage to seeded areas resulting from erosion and/or overwatering.
- B. Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

END OF SPECIFICATIONS